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EXAMINER

HM22/0317

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ART UNIT

PAPER NUMBER

1627

DATE MAILED:

03/17/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

08/847,967

Applicant(s)

Goldwasser

Examiner

Joseph W. Ricigliano Ph. D.

Group Art Unit

1627

☒ Responsive to communication(s) filed on Dec 16, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 2, 4, 5, 8, 10, 11, 15-24, 26, 29-36, and 42-73 is/are pending in the application.

Of the above, claim(s) 58, 59, and 61-63 is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 2, 4, 5, 8, 10, 11, 15-24, 26, 29-36, 42-57, 60, and 64-73 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 13

☒ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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### **DETAILED ACTION**

1. This action is responsive to the amendment and response of 9/3/99.
2. This action is responsive to applicants' response and amendment of 9/3/99 and the response to the supplemental election of species of 1/4/00 papers number 12 and 15 respectively.
3. Claims 1,3,6,7,9,12-14, 25, 27, 28, and 37-41 have been canceled.
4. Claims 58, 59 and 61-63 are withdrawn as being drawn to non-elected species.

Note that applicants have elected the species where in the materials are applied by electron beam evaporation, the materials are to be screened for optical properties and the materials are to be inorganic materials, specifically ceramics.

5. Claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 are pending and being examined on their merits to the extent of the elected species.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the materials and uses exemplified in the specification, does not reasonably provide enablement for the scope of all of the materials which could be used or all of the methods of evaluation which could be conducted encompassed by the claims. The specification does not enable any person skilled in the art to

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which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 are directed toward methods of making and evaluating arrays of materials. The disclosure teaches a number of materials that can be made. However, making and using any literally any material and evaluating it in literally any process by screening it for undisclosed and unspecified and unlimited properties for uses which are not disclosed does not appear to be within the scope of reasonable experimentation. The factors to be considered in a determination of undue experimentation are disclosed in *In re Wands*, (U.S.P.Q. 2d 1400 (CAF 1988)). The factors to be considered include: the quantity of experimentation necessary, the amount of direction or guidance presented, the presence or absence of working examples, the nature of the invention, the state of the prior art, the predictability of the art and the breadth of the claims.

A number of factors would prevent one of skill in the art from practicing the invention without undue experimentation, these are summarized as follows:

1) The specification fails to give adequate direction and guidance in numerous areas:

1a) Applicant claims cover the application of any two or more component to a region to form an array. There is no teaching as to when different types of application processes will damage, alter or effect the properties of the material being applied with respect to the desired end properties which the materials are to be used for.

1b) Applicants give inadequate guidance as to which components from an endless variety of components (spanning any organic or inorganic material ) are to be combined and the means by

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which they are to be combined (e.g., fusing, interspersing, reacting etc.), to achieve specific properties.

1c) Even once an array is made applicants fail to give adequate guidance as to which materials will have given properties and what to use them for. For example, should organic polyolefin arrays be screened with any reasonable expectation of success for catalytic activity, optical properties, electrical properties, specific affinity for selected biomolecules or as antiinflammatory drugs, or simply for undisclosed screening purposes? Similarly should one screen an array of polyamides or niobium salts for the same properties or different properties?

1d) There is inadequate guidance as to how to evaluate arrays for the scope of the claimed subject matter, mostly due to the fact that there is inadequate guidance in the means by which screening for any property can be accomplished. The lack of guidance in screening techniques is exacerbated when the array elements approach the limits of the smallest size of the array, as many techniques and pieces of equipment are not adapted directly to such small samples in close proximity with other samples.

2) Applicants have failed to provide working examples commensurate in scope with the claimed subject matter.

2a) Applicants have provided a few working examples however, these are in no way commensurate in scope with the claimed subject matter.

3) The breadth of the claims

3a) The breadth of the claims encompasses literally any material which is made by combining any two or more components.

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4) The state of the prior

4a) The state of the prior art is such that arrays have been made which are used for a number of different processes. The majority of the arrays are directed <sup>to</sup> biologically relevant organic materials.

5) The art is inherently unpredictable because it is not possible to predict *a priori* which materials will have which properties, or how the methods of applying the materials will effect the properties for the scope of the claimed methods.

Therefore, while it is true that the level of skill in the art is high, it would require undue experimentation to make and use the invention which is commensurate in scope with that claimed in the absence of guidance in the areas as set forth above.

8. *Applicant's arguments filed 9/17/99 have been fully considered but they are not persuasive. Applicants argue that they are enabled essentially because there is a "vast warehouse of knowledge regarding materials" and as such the breadth of the claims is enabled. The examiner disagrees as the instant claims would cover literally any process of making any materail which has more than one component evaluating it for propties. While there may be a vast warehouse of knowledge concerning any number of embodiments encompassed by the claims, this is not commensurate in scope with knowledge adequate knowledge of every type of material, their properties, the means by which to make them and test them as set forth by the claims. The examiner has restated the 112 first paragraph rejection in order to give applicants a clearer understanding of why there exists substantive undue experimentation in making and*

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*using the invention commensurate in scope with that claimed. Therefore the rejection is maintained for the reasons above and for the reasons of record in paper number 14.*

9. In view of applicants amendments and cancellation of claims, the rejections under 35 USC 112 second paragraph have been withdrawn and where applicable rewritten as new grounds of rejection necessitate by amendment.

### ***New Grounds of Rejection***

#### ***Specification***

10. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). Applicants are requested to submit an additional copy of the abstract along with their response to this action.

#### ***Claim Objections***

11. Claims 30-36 are objected to because of the following informalities: Claims 30 -36 recite that the materials comprise some specified number of components. However, the specification teaches that materials are comprised of components, not the other way around. It is suggest that the claims be amended along the lines of : the “materials are comprised of 3 or more components”

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

12. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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13. Claim 48 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

14. Claim 48 recites that the components interact without reacting, intermingling, interdiffusing... or fusing. Applicants have failed to indicate where support for this amendment can be found and it does not appear to be supported in the disclosure as originally filed. Applicants can overcome this rejection by indicating where support can be found for the amendment in the disclosure as originally filed.

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16. Claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

17. Claims 2, 4-5, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 recite that the materials are "different." This is vague and indefinite because it is not clear what limitations apply to "different." For example does this mean as literally stated that the materials are not the same item or that the materials may be in different locations of the array and hence be different? Therefore, it is not possible to determine the metes and bounds of the invention as claimed. If applicants



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intend that different relates to different properties or structures, such as those recited in claim 8, then the claims should be amended to recite this.

18. Claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, 64-67 and 72-73 recite that there is a sufficient amount of space between the regions to prevent materials from substantially interdiffusing. This is vague and indefinite for two reasons. First, it is unclear what a sufficient amount of space is. As materials may be directly applied as solids there would be essentially a limited ability of the materials to interdiffuse, hence one would conclude that the sufficient space includes no space at all but that the solids may be placed directly next to each other. Second, it is unclear what limitations apply to "substantially interdiffuse." Therefore, it is not possible to determine the metes and bounds of the invention as claimed.

*Rebuttal  
to  
the  
objection  
of  
indefiniteness  
under  
35 U.S.C. 112(b)*

19. Claims 51-56 recite that the arrays have a density greater than about a specified value per  $\text{cm}^2$  this is vague and indefinite as it is not clear what limitations apply to "about" and hence what density the arrays must have in order to meet the limitations of the claim. Therefore, it is not possible to determine the metes and bounds of the invention as claimed.

20. Claims 2, 15-22, 29-36, 43-67, 69, 71 and 73 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. Claims 2, 15-22, 29-36, 43-67, 69, 71 and 73 recite a method for evaluating an array where in the materials are screened. As the screening process is essential to the method of evaluating the array the method steps are essential steps. The claims as written omit the steps required for the screening.

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21. Claims 2, 15-22, 29-36, 43-67, 69, 71 and 73 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
22. Claims 2, 15-22, 29-36, 43-67, 69, 71 and 73 recite a method of evaluating an array where in the materials are screened for a property of interest. This is vague and indefinite for two reasons. First, the claims fail to set forth any of the steps for screening. Second, the claims fail to set forth what a property of interest is. Hence, it is not possible to determine what is included or excluded from the metes and bounds of the invention as claimed.
23. Claims 24 and 66 recite the materials are delivered by as series of techniques including electron beam evaporation explicitly recited in claim 66. This is vague and indefinite as it is unclear if the materials are delivered by a method comprising or consisting of the recited techniques including electron beam evaporation. Hence, it is not possible to determine the metes and bounds of the invention as claimed. In order to proceed with more compact prosecution the claims have been given their broadest reasonable interpretation consistent with the specification and read as comprising claims.
24. Claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-73 recite that materials are delivered to a region of as substrate. This is vague and indefinite because it is unclear if applicants intend the regions to be the predefined regions on which one material is prepared or if a region can be any portion of a substrate spanning more than one predefined region. Therefore, it is not possible to determine the metes and bounds of the invention as claimed. If applicants intend the region to be a predefined region as recited on page 15 of the specification then applicants should amend the

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claims to clearly recite this. In the alternative, if applicants intend a region to span more than one predefined region they should amend the specification to recite this and indicate where support can be found in the disclosure as originally filed.

25. Claims 30-36 are indefinite as it is unclear if the ten materials collectively are comprised of the stated number of components or if each of the ten individual materials must have the stated number of components. Therefore, it is not possible to determine the metes and bounds of the invention as claimed.

26. Claim 48 recites that the components interact without reacting, intermingling, interdiffusing... or fusing. This is vague and indefinite as it is unclear how the materials can interact when the claim appears to exclude every possible means by which the components can come together short of simple contact between two solids. As such it is not possible to determine the metes and bounds of the invention as claimed.

27. Claim 65 recites that the 10 more different materials comprise 3 or more layers. This is vague and indefinite as the materials are supposed to be in different regions. If the materials are in layers they would be in the same region which would not be permitted by the method of claim 42 from which claim 65 depends. As such it is not possible to clearly determine the metes and bounds of the process being defined by claim 65. If applicants intend the 10 or more materials are comprised of 3 or more layers then they should amend the claims to clearly recite this and indicate where support can be found in the original disclosure.

28. Claims 15-20 recite that a specified number of materials (20- 10,000) or more different materials comprise 2 or more layers. This is vague and indefinite as the materials are supposed to

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be in different regions. If they comprise layers they would be in the same region which would not be permitted by the method of claim 42 from which they ultimately depend. As such it is not possible to determine the metes and bounds of the process being defined by these claim. If applicants intend the materials to be comprised of 2 or more layers then they should amend the claims to clearly recite this and indicate where support can be found in the original disclosure

***Claim Rejections - 35 USC § 102 and 102/103***

29. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

30. Claims ~~2, 4-5, 8, 10, 11, 15-19, 23, 24, 26, 29-36, 42-54, 57, 60, 64-66 and 68-73~~ are rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35

U.S.C. 103(a) as obvious over Cavicchi et al [US 5,365,756].

With respect to the independent claims Cavicchi et al. teach in their abstract (1) preparing a substrate for receiving materials through temperature and bias control, (2) deposition of materials to form a micro array, (3) processing (i.e., heating, cooling, etc.) the array in any atmosphere, (4) formation of alloys (i.e., mixing of components) on the substrate, and (5) measuring the resulting properties of the materials formed. The reference also teaches forming up

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to 1000 micro-samples in the arrays (col. 3, lines 37-50) and that each sample is prepared on a separate microfabricated hot plate such that the components do not substantially interdiffuse between the isolated microstructures of the ten or more regions required. The reference also teaches applying at least two materials (e.g., Sn and oxygen) to form  $\text{SnO}_2$  films (see figure 6). The reference also teaches the epitaxial growth (i.e., overgrowth in layers of a crystalline substance in a defined orientation on a substrate comprised of different crystalline materials) which reads on the materials comprising two or more layers (see column 13 lines 5-26).

Therefore, claims 42, 68 is anticipated and as the materials used in the reference are inorganic, claim 70 is anticipated. In addition as the reference teaches the sample regions are less than 1 cm (col. 1, lines 57-62) claim 72 is anticipated.

With respect to the dependent claims:

As the reference teaches the microsubstrates can be used to prepare and test properties of the materials (e.g., electrical properties as discussed in the abstract and superconductors, col 13 lines 33-60) the reference anticipates claims 43, 69, 71 and 73 which are drawn to methods of evaluating the arrays of the independent claims.

As the reference teaches that materials can be delivered to all regions together (e.g., the Sn and oxygen were delivered to all regions at one the reference teaches parallel delivery as required by claim 4. As the reference teaches that masks can be used to direct the application of materials to desired regions:

“Another deposition technique which can be used according to the present invention involves lithographically to define selected microsubstrates for deposition. For example, it is possible to coat an entire chip with a photoresist and thereafter expose selected micro-hotplates using a mask and appropriate illumination. Development proceeds by dissolving the exposed photoresist in a solvent in a known manner.” ( See column 10)

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and

Claim 6. A method of preparing a plurality of micro-samples of materials for investigation according to claim 5, wherein said lithography process involves applying a resist material to said substrate, irradiating portions of said resist material utilizing a mask and removing said irradiated portions of said resist material the materials.

The reference teaches that materials can be delivered in sequentially to different regions as required by claim 5. In addition claim 23 which utilizes physical masking is also anticipated.

As the reference teaches application of gas phase reactants to alter the stoichiometry the materials ( see abstract) the reference anticipates claim 8. As oxygen may be considered the first or second component and it is delivered in a different amount based upon the temperature the substrates during SnO<sub>2</sub> preparation (see figure 6 and associated text) the reference anticipates claims 10 and 11. As the reference teaches preparing up to 1,000 different micro-samples claims 15-19 are anticipated.

As the reference teaches that materials may be applied by electron beam evaporation it anticipates claims 24 and 66 (see column 10, lines 55-58).

As the reference teaches the preparation of superconductors and that optical semiconductor materials such as GaAs can be grown on the microsubstrates and analysis using different techniques including optical techniques (col. 11 lines 46-62) it, it anticipates the invention of claims 26, 29 and 50.

The reference also teaches that layers of materials can be applied on those which have previously been applied and hence claims 30-36 and 65 are anticipated. Moreover, as the apparatus is essentially planer (see figure 5) and layers may be applied to microsubstrate regions of the array, claims 44 and 45 are anticipated.

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As the reference teaches that the applied components may be applied in layers (discussed *supra*) and that they may react (e.g., Sn and oxygen react to give  $\text{SnO}_2$ ) and that chemical vapor deposition may be used to apply materials, claims 46-49 are anticipated.

In that the regions for microfabrication set forth in the reference are clearly less than 1 cm square, the reference anticipates claims 51-54.

In that the materials such as Sn and oxygen are inorganic materials claim 57 is anticipated. Moreover, the reference teaches that  $\text{YBa}_2\text{Cu}_3\text{O}_7$  superconductors, Si, GaAs and  $\text{SnO}_2$  may be applied which read on ceramic materials and that:

“ Pixels are also addressed to control properties during post-deposition processing steps such as heating in vacuum or various gases to alter stoichiometry of a single material, or to alloy multiple composition materials.”,

hence, claim 60 and 64 are anticipated.

One of ordinary skill in the art might argue that the reference does not anticipate the instant claims because the reference does not actually prepare 1,000 samples but rather only prepares a small number.

It would have been *prima facie* obvious to one of ordinary skill in the art to prepare arrays of large number of materials (e.g., 500 or 1,000 etc.) using the method of Cavicchi et al because the reference specifically teaches that it is possible to make arrays for the preparation of 1,000 microsamples. One of ordinary skill in the art would have been motivated to do so because the reference specifically teaches that commercial implementation might include standard chips with 500 structures (col 14 lines 17-25) and this would allow one to prepare and test multiple samples at once. One of ordinary skill in the art would have reasonably expected to be successful because

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Cavicchi et al teach the required methodology to prepare the microsubstrates for materials preparation and processing.

31. Claims 2, 4-5, 8, 10, 11, 15- 24, 26, 29, 42-44, 46-57, 60, 64, 66 and 68-73 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chern et al [US 4,454,646].

With respect to the independent claims Chern et al. teach in their abstract preparing a substrate layer having continuous graduations in refractive index or thickness by exposing the substrate to two vapor phase reactants (e.g.,  $\text{SiH}_4$  and  $\text{NO}_2$  etc.), which read on first and second components. These reactants are delivered in continuous and predetermined ratios to produce a continuous graduations of stoichiometric composition and refractive index and/or thickness across the substrate. In addition the specification at col. 12, starting at line 15 teaches that segments of the surface may be irradiated in the photochemical vapor phase deposition process described in the reference to produce continuous gradients in thickness and specifically recites that:

“This variation in thickness may be in a continuous manner or in a stepped manner, as determined by the scanning pattern the laser beam. The resulting structure has a continuously graded index layer as a function of thickness as previously described herein, and, in addition, the thickness of that layer varied in a predetermined pattern across the surface of the substrate. Since the amount of modulation within a given thickness determines the periodicity of the index modulation, the deposited layer on different segments of the substrate surface will have different periodicities.”  
(emphasis added)

As the materials set down is a solid (e.g.,  $\text{SiOx}$ ), the space between the materials required to prevent substantial interdiffusion is no space at all. Moreover, the regions having a difference in thickness approach the infinitesimal values (e.g. zero) when the gradient is continuous. Thus,



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there are effectively infinite regions each corresponding to the infinitesimal differences in thickness over the range of thickness.

Therefore, independent claims 42, 68 is anticipated and as the materials used in the reference are inorganic, claim 70 is anticipated. In addition, as the continuous thickness gradient produces effectively infinitely small regions which are less than 1 cm (col. 1, lines 57-62) claim 72 is anticipated.

With respect to the dependent claims:

As the reference evaluates the materials for optical properties, the reference anticipates claims 43, 69, 71 and 73 which are drawn to methods of evaluating the arrays of the independent claims.

As the reference teaches that the photovapor deposition materials (e.g.,  $\text{SiH}_4$  and  $\text{NO}_2$  etc.) can be delivered specific regions being illuminated the reference teaches that the components are delivered to a substrate region in parallel as required by claim 4. As a scanning laser can be used to illuminate different segments (regions) of the substrate the materials are deposited to different regions sequentially as required by claim 5.

The reference also teaches masks can be used to limit the illumination to specific segments (col. 13, lines 1-8), hence, claims 5 and 23 which utilizes physical masking are also anticipated.

As the reference teaches application of gas phase reactants to alter the stoichiometry and the thickness of materials ( see abstract) the reference anticipates claim 8. As either of the gas phase components may be considered the first or second component and each is delivered in different amounts resulting in different thickness films in each region, the reference anticipates

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claims 10 and 11. As the reference teaches preparing up to a continuous thickness gradient that can be divided into anywhere between 10 and 1,000,000 different regions, claims 15-22 are anticipated.

As the reference teaches that materials may be applied by electron beam evaporation (col. 15, line 1) it anticipates claims 24 and 66 (see column 10, lines 55-58).

As the materials produced have optical properties and each region of the film which is continuously varied in thickness is evaluated for optical properties such as the band pass at specific wavelengths (see col. 14, lines 1-4 for example) the reference, anticipates the invention of claims 26, 29 and 50.

Moreover, as the gradient of material may be applied to a planar surface the ten different materials varying in thickness consist essentially of a layer as required by claim 44.

As the reference teaches that the applied components interact and react (discussed *supra*), claims 46, 47 and 49 are anticipated.

In that the regions in the continuous thickness gradient in the reference can be infinitesimally small, the reference anticipates claims 51-56.

In that the different thickness materials are made of materials such as SiO<sub>2</sub> which is a solid inorganic ceramic material, claims 57, 60 and 64 are anticipated.

32. Claims 2, 5, 8, 10, 11, 24, 26, 29-31, 36, 42-44 and 46-47, 49-54, 64, 68-69 and 72-73 are rejected under 35 U.S.C. 102(e) as being anticipated by Rolleston et al [5,416,613].

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With respect to the independent claims Rolleston et al. teach a method of preparing an array of color patches which are used to calibrate color printers. The patches are prepared by the application of three different components (red blue and yellow colorants; RGB) or four different colorants (cyan, magenta yellow and black; CMYK), see col.3 lines 41-45 and col. 1 lines 25-28. As the regions are applied on a substrate with enough room to prevent substantial interdiffusion, independent claims 42, 68 are anticipated. In addition as the reference teaches preparation of a 500 color patch array in a 7 x 9 inch array, which translates to about 1.2 color patches/ 1 cm (col. 6, lines 19-21) claim 72 is anticipated.

With respect to the dependent claims:

As the reference teaches the target array of color patches produced by the printer can be evaluated by comparing them to the target patches which reads on screening the array for its color values, claims 43, 69, 71 and 73 which are drawn to methods of evaluating the arrays of the independent claims are anticipated.

As color printers set forth colorants, which read on components, sequentially, claim 5 is anticipated.

As the color patches differ in the composition of the colorants, the reference anticipates claim 8. As different amounts of the colorants are delivered to different paths and any colorant may be considered the first or second component claims 10 and 11 are anticipated.

As printers can spray and dispense liquids, or apply solid dry toners the reference anticipates claims 24.

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As the reference teaches analysis of the array of color patches for the color value(which reads on an optical property), the invention of claims 26, 29 and 50.

The reference also teaches three or four colorants can be applied and hence claims 30-31, 36 and 65 are anticipated. Moreover, the printed array is essentially planer (see figure 2) and thus claims 44 is anticipated.

As the applied components (colorants) interact by intermingling, or interdiffusing or interspersing or interpenetrating, or fusing claims 46-47 and 49 are anticipated.

In that the density of the 500 color patch array in a 7 x 9 inch array is about 1.2 color patches/ 1 cm (col. 6, lines 19-21) claims 51-54 are anticipated.

As the final materials produced upon drying of liquid colorants or fusing of solid toners as in a Xerox process are solids claim 64 is anticipated.

### ***Claim Rejections - 35 USC § 103***

33. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

34. Claims 20-22, 55-56 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cavicchi et al. [US Patent 5,356,756].

See the teaching of Cavicchi et al as applied under 35 USC 102(e) *supra*. The reference fails to explicitly teach 10,000-1,000,000 materials are to be made as required by claims 20-22.

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The reference also fails to explicitly teach that the density of materials sites would be greater than about 10-100 regions per cm square as required by claims 55-56. The reference fails explicitly teach that at least one component is different and one is the same for the regions as set forth in claim 67.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to prepare arrays with 10,000- 1,000,000 samples using the method of Cavicchi et al because the reference teaches that it is advantageous to screen numerous samples simultaneously. One of ordinary skill in the art would have been motivated to do so in order to accelerate the research process and to be able to perform parallel exploration of a wide parameter space for materials processing (see col. 3, lines 37-50). One of ordinary skill in the art would have expected to be successful preparing arrays with more members as it requires using the same process already demonstrated by Cavicchi et al on a larger scale or simply using multiple arrays of the type taught by Cavicchi et al. Moreover, it would have been prima facie obvious at the time the invention was made to place as many as about 100 regions on a 1 cm square region because Cavicchi et al teach that microfabrication techniques permit defining structures at resolutions of less than 0.1 mm (see column 1 lines 35-37) and that using micromachining techniques they create the claimed microarrays. One of ordinary skill in the art would have been motivated to do so and reasonably expected to be successful because Cavicchi et al teach the benefits of making micro arrays (see col. 3 lines 50-60 for example) and the techniques involved therein. Last, it would have been prima facie obvious to one of ordinary skill in the art to prepare arrays with at least one component being the same and at least one component being different between the

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regions of the array because the reference teaches masking for the application of materials to selective regions of the array which renders obvious putting a different material on at least one region and the reference also teaches applying the same component material to all regions.

35. Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rolleston et al [5,416,613].

See the teachings of Rolleston as applied to claims 2, 5, 8, 10, 11, 24, 26, 29-31, 36, 42-44 and 46-47, 49-54, 64, 68-69 and 72-73 under 35 U.S.C. 102(e) *supra*.

Rolleston et al do not explicitly recite that at least one component is different and at least one component is the same for at least 10 or more materials in the array.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to prepare an array where at least one component is different and at least one component is the same for at least 10 or more materials in the array as taught by Rolleston because holding one or more components constant while varying the independent component would allow for systematic analysis of color space. One of ordinary skill in the art would have been motivated to do so in order to prepare an array in which it was possible to determine which components were either in or out of calibration more easily and would have reasonably expected to be successful because Rolleston et al had already taught the required preparation of arrays with as many as four components.

***Double Patenting***

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36. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

37. Claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-67 of U.S. Patent No. 5,985,356. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are directed to methods of making and methods of making/evaluating arrays of inorganic compounds (elected species) by adding a first and second component of a material to different regions of a substrate.

38. Claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-49 and 56-61 of U.S. Patent No. 6,004,617. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are directed to methods of making and methods of making/evaluating arrays of inorganic compounds (elected species) by adding a first and second component of a material to different regions of a substrate. It is also noted that the claims of the '617 patent recites making at least two arrays. As

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the arrays of the instant application are neither limited to being constructed on a single monolithic support, nor are the two arrays of the '617 limited to being prepared on separate supports this limitation does not distinguish the inventions. Moreover, preparing two or more copies of an array by method of the instant claims would read on the two arrays of the '617 patent. One of ordinary skill in the art would reasonably have been motivated to prepare more than one copy of the array in order to use them in a series of destructive tests or to sell the arrays.

39. Claim 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 94-120 of copending Application No. 09/127,195. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are directed to methods of making and methods of making/evaluating arrays of inorganic compounds (elected species) by adding a first and second component of a material to different regions of a substrate.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

40. Claim 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 42-57, 60, and 64-73 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 of copending Application No. 09/156,827. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are directed to methods of making and methods of making/evaluating arrays of inorganic compounds (elected species) by adding a first and second component of a material to



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different regions of a substrate. It is noted that in the '827 application the methods require dissolving components prior to addition. However, the instant application teaches and claims liquid dispensing of components and using inorganic compounds (which includes salts) and renders obvious dissolving the materials first.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

41. In order to proceed with more compact prosecution the examiner respectfully request applicants to review their copending applications for additional double patenting issues and to bring specific applications to the examiners attention as applicants currently have numerous copending applications under prosecution.

42. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph W. Ricigliano Ph. D. whose telephone number is (703) 308-9346. The examiner can be reached on Monday through Thursday from 7:00 A.M. to 5:30 P.M.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (703) 308-0196.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald E. Adams Ph. D., can be reached at (703) 308-0570.

Joseph W. Ricigliano Ph. D.

**BENNETT CELSA  
PRIMARY EXAMINER**



**JOHN E. KITTLE  
DIRECTOR, TC 1600**